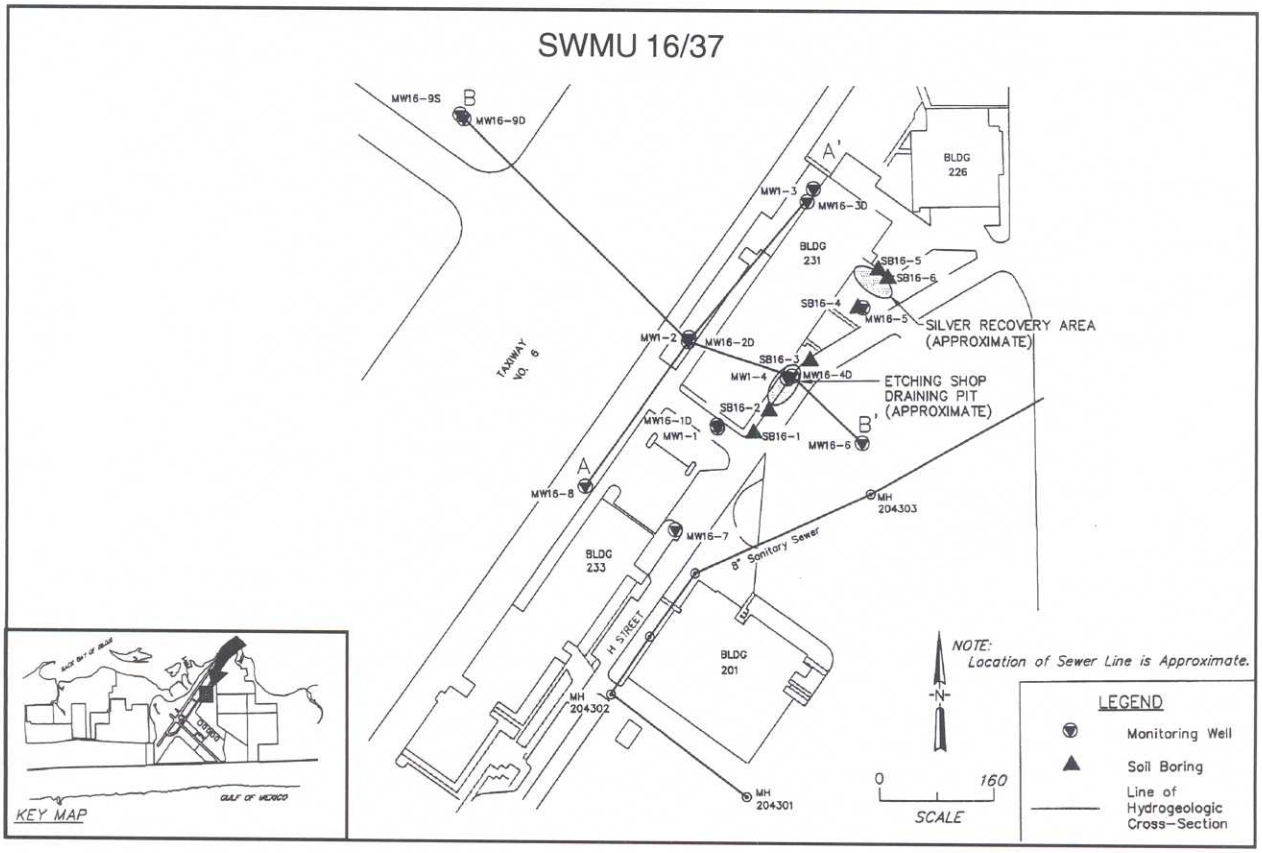
KEESLER AIR FORCE BASE
INSTALLATION RESTORATION PROGRAM
KEESLER AFB, MISSISSIPPI

Statement of Basis - Solid Waste Management Units (SWMU) 16 and 37

IRP SITE DESIGNATION

Etching Shop Draining Pit: IRP Site Code WP-11, RCRA Site Code SWMU 16.

Silver Recovery Area: IRP Site Code WP-11, RCRA Site Code SWMU 37.



INTRODUCTION

Keesler Air Force Base (Keesler AFB) is located within the city limits of Biloxi, Mississippi, on the peninsula surrounded by the Back Bay of Biloxi and the Mississippi Sound. The Etching Shop Draining Pit (SWMU 16/WP-11) is located on the southeast side of Building 231 adjacent to H Street. This area was used from the early 1970's to 1981 for the disposal of wastewater from the Training Aids Etching Shop. Wastes from the Etching Shop, which may have consisted of acids and solvents, were piped to the pit. Three buried 55-gallon drums served as a leaching bed. In 1981, the drainage pit was closed and the wastes were piped to the sanitary sewer.

The Silver Recovery Area (SWMU 37/WP-11) is located approximately 100 feet northeast of SWMU 16. Photo processing fluids were originally discharged directly from the development room to an outdoor pit. A separation unit was added later to remove usable silver from the waste photographic processing fluids and the effluent from the separator was allowed to drain directly onto the ground. The exact location of the pit has never been established. This practice was stopped with the startup of the Defense Reutilization and Marketing Office silver recovery unit.

This document, called a Statement of Basis (SB), is part of the cleanup process and is a requirement of the RCRA permit issued by the United States Environmental Protection Agency (USEPA). The proposed remedy, long term monitoring and land use controls (LUCs), is explained in this SB along with any other possible remedies that have been evaluated. Public comment and participation in the remedy selection process is requested.

The information presented in this SB summarizes the information obtained from previous investigations conducted at SWMU 16/37 (WP-11). Detailed information concerning these two SWMUs can be found in the RCRA Facility Investigation (RFI)/ Group 1 Sites Report (RFI Report, April 1999) and the Final Groundwater Sampling Report for SWMU 16 and SWMU 37 (February 2000).These documents are available in the Administrative Record. The Administrative Record is located at the information repositories identified later in this SB.

The public is encouraged to comment and participate in the remedy selection. The public is also encouraged to review the Administrative Record. The USEPA will select a final remedy for SWMU 16/37 (WP-11) only after the public comment period has ended and all comments are reviewed and considered.

PUBLIC COMMENT PERIOD AND PUBLIC MEETING

The public is encouraged to provide comments regarding the corrective action alternatives provided in: the RFI Report, April 1999, the Groundwater Sampling Report, February 2000, and this SB. In addition, the public may comment on any other corrective action alternatives, including those not previously evaluated or presented in the above mentioned documents.

Important dates to remember

Public comment period begins:
June 1, 2001

Public comment period ends:
July 15, 2001

Please note, written comments must be postmarked no later than midnight, **July 15, 2001**. A public meeting will be held, if requested. During the public meeting, USEPA, Mississippi Department of Environmental Quality (MDEQ), and the U.S. Air Force will be available to respond to oral comments and questions.

Comments received will be summarized and responses will be provided in a Response to Comments Document. This document will be prepared following the close of the public comment period. The comments and responses to comments will be included with the final permit modification in the Administrative Record.

The Administrative Record for SWMU 16/37 (WP-11) is available at:

Biloxi Public Library
Reference Section
139 Lameuse Street
Biloxi, Mississippi
Monday, Tuesday, Wednesday, 9 A.M. to 8 P.M.
Thursday, Friday, Saturday, 9 A.M. to 5 P.M.

To request further information please contact:

Ms. Lisa Noble
Keesler AFB, Mississippi
(228) 377-8255
lisa.noble@keesler.af.mil

or

Mr. Robert Pope
U.S. Environmental Protection Agency, Region 4
(404) 562-8506
pope.robert@epa.gov

or

Mr. Bob Merrill
Mississippi Department of Environmental Quality
(601) 961-5049
bob_merrill@deq.state.ms.us

Submit written comments to:

U.S. Environmental Protection Agency
Attention: Mr. Robert Pope
US. Environmental Protection Agency, Region 4
Federal Facilities Branch
61 Forsyth Street
Atlanta, GA 30303

Comments must be postmarked no later than midnight, **July 15, 2001**.

PROPOSED REMEDY

The USEPA is proposing long-term groundwater monitoring and land use controls (LUCs). The LUCs will include groundwater use and land use restrictions.

SWMUs 16/37 (WP-11) DESCRIPTION

The Etching Shop Draining Pit (SWMU 16/WP-11) is located on the southeast side of Building 231 adjacent to H Street. This area was used from the early 1970's to 1981 for the disposal of wastewater from the Training Aids Etching Shop. Wastes from the Etching Shop were piped to the pit, which existed as an open French drain leading to three buried 55-gallon drums containing limestone gravel. The drums served as a leaching bed. In 1981, the drainage pit was closed and the wastes were piped to the sanitary sewer. Wastes disposed in the pit may have consisted of acids, organic solvents (such as toluene and xylene), ferric chloride, and potassium ferricyanide. In addition, the wastewater potentially included dissolved/suspended metals including copper, nickel, and chromium.

The Silver Recovery Area (SWMU 37/WP-11) is located outside the exterior of Building 231 approximately 100 feet north east of SWMU 16. Photo processing fluids were originally discharged directly from the development room to an outdoor pit. The pit may have contained a buried drum that served as a leaching bed. A separation unit was added to remove reusable silver waste photography processing fluids from the Medical Center and Visual Services building. Effluent was allowed to drain directly onto the soil around the separator. Later, electrolytic silver recovery was attempted; it is not known if any reusable silver was ever actually recovered. The exact location of the pit has never been established.

SWMU 16/37 (WP-11) Investigations and History

Prior to 1991, the field investigations at SWMU 16/37 (WP-11) included installation of four shallow monitoring wells, and the sampling of one soil boring at one-foot intervals to a total depth of 8 feet. Soil and groundwater samples were analyzed for selected inorganic and organic compounds.

In 1992, an RFI was conducted at SWMU 16/37 (WP-11). During this investigation, the two SWMUs were investigated as one site due to their proximity to one another and the similarity of the wastes at each site. The RFI consisted of a soil vapor survey, and the soil sampling, and the installation and sampling of additional groundwater monitoring wells. These investigations were conducted to further characterize the nature and extent of contamination at SWMU 16/37. In 1996, additional groundwater samples were collected and analyzed for metals only. The analytical data obtained during this investigation were used to evaluate human health risks.

The monitoring wells at SWMU 16/37 were sampled again in October 1999 to evaluate the groundwater contamination that had previously been identified. The fourteen wells were sampled and the samples were analyzed for volatile organic compounds and metals. The results of this sampling were compared to the risk assessment results of the RFI.

SWMU 16/37 (WP-11) Investigation Results

Volatile organic compounds and metals were detected in soil and groundwater at the site. Using soil and groundwater data collected during the RFI and groundwater data collected in 1996, a Human Health Risk Assessment (HHRA) was performed. The RFI Report was finalized in April 1999. Based on the results of the RFI and the HHRA, a Decision Document (DD) was prepared and submitted to USEPA_and MDEQ. The October 1999 sampling was requested by USEPA and MDEQ as part of the DD review.

SUMMARY OF SWMU 16/37 (WP-11) RISKS

Soil and groundwater analytical results from the RFI Investigation and additional groundwater data obtained in 1996 was used to evaluate human health risks associated with exposure to contaminants in the affected media (RFI Report, April 1999).

For human health, USEPA Region 4 has established a target level below which derived cancer risks and non-cancer hazards are considered to be acceptable. Risks were evaluated for current industrial workers, future industrial and construction workers, and hypothetical future residents (both adults and children) and compared to the USEPA Region 4 target levels.

Current industrial workers at SWMU 16/37 (WP-11) were assumed to be exposed only to soils located at the surface (surface soil). All future receptors were expected to be exposed to contaminants in both surface and deep (subsurface) soil. In the future, excavation activities are assumed to result in deep soils being uncovered and brought to the surface, resulting in the deep soils becoming available for contact by the future workers. In addition, future industrial workers and hypothetical future residents were expected to be exposed to groundwater.

Using USEPA Region 4 methodology, Chemicals of Concern (COCs) were identified for the hypothetical future residents. Although COCs were identified for the hypothetical future resident, it should be noted that, given the current use of the site and anticipated future use as an industrial area, it is highly unlikely that residential development will ever occur at SWMU 16/37. Although the hypothetical future resident is not expected to live at the site, this group was included in the risk assessment to allow a health-protective evaluation of the soil and groundwater at SWMU 16/37. The total risks and hazards derived for all other receptors were below the USEPA target levels for cancer and non-cancer effects.

Human Health COCs in soil and groundwater for hypothetical future residents at SWMU 16/37 were identified per USEPA Region 4 guidance (total scenario cancer risk greater than or equal to $1x10^{-4}$ [one in 10,000] and a total scenario hazard index [noncancer effects] greater than or equal to 1.0). The COCs included volatile organic compounds and metals in groundwater and beryllium in surface and deep soil. The RFI recommended that the volatiles in groundwater (1,1-dichloroethene, tetrachloroethene, trichloroethene) be considered final COCs at SWMU 16/37, but that antimony and arsenic in groundwater and beryllium in surface and deep soil be eliminated from further consideration. These metals were eliminated as COCs because of the low magnitude of risk associated with exposure, uncertainty of the quality of data used in the evaluation, and the fact that the onsite concentrations for some of the metals are similar to concentrations that reflect natural background conditions in the area. In addition, arsenic was present at a level below its USEPA regulatory level (Maximum Contaminant Level - MCL) in groundwater.

The majority of the risk derived for the hypothetical future residents, however, was associated with groundwater contact (drinking and bathing in water obtained from a hypothetical well located on the site). It should be noted that Keesler AFB currently obtains drinking water from wells onsite completed in a deep aquifer and it is not likely that any future group will obtain drinking water from a shallow onsite well. Exposure to groundwater beneath the site, therefore, is considered to be highly unlikely for any future receptor group.

The COCs identified for the hypothetical residents (combined adult and child) from the human health risk assessment are presented in the following table along with their associated cancer and noncancer risk.

An ecological characterization was performed to evaluate pathways for exposure of wildlife and vegetation to site contaminants (RFI Group 1 Sites Report, April 1999). The conceptual model indicated that there are no complete exposure pathways at this site. The site and surrounding area are developed; therefore, a baseline ecological risk assessment of the site was not conducted.

CORRECTIVE ACTION SCOPE

The Corrective Action proposed in this SB is intended to be the only corrective action taken at SWMU 16/37. The corrective action includes long-term groundwater monitoring and land use controls such as restricting groundwater use. This action poses no threat to human health or the environment based on current site conditions at SWMU 16/37. Annual reporting of the groundwater sampling results and site status are required as part of the remedy.

Medium	COC (1)	Maximum Detected (2)	Federal MCL (3)	MS MCL (4)	Exposure Routes (5)	Cancer Risk (6)	HQ (non-cancer) (7)
Surface Soil	Beryllium	$1.86x10^{-1}$	NR	NR	Dermal	$3.20x10^{-6}$	NA
Subsurface Soil	Beryllium	$1.63x10^{-1}$	NR	NR	Dermal	$1.90x10^{-6}$	NA
Groundwater	Arsenic	$3.10x10^{-3}$	$5.00x10^{-2}$	$5.00x10^{-2}$	Ingestion	$6.90x10^{-5}$	$9.40x10^{-1}$
	Antimony	$2.43x10^{-2}$	$6.00x10^{-3}$	$6.00x10^{-3}$	Ingestion	NA	NA
	1,1-Dichloro-ethene	$4.00x10^{-3}$	$7.00x10^{-3}$	$7.00x10^{-3}$	Ingestion Dermal/ Inhalation	$7.20x10^{-5}$	NA
	Tetrachloro-ethene	$1.90x10^{-2}$	$5.00x10^{-3}$	$5.00x10^{-3}$	Ingestion Inhalation Dermal	$2.94x10^{-5}$	$2.40x10^{-1}$
	Trichloro-ethene	$4.70x10^{-2}$	$5.00x10^{-3}$	$5.00x10^{-3}$	Ingestion Dermal/ Inhalation	$1.54x10^{-5}$	NA

(1) Chemical of Concern

(2) Maximum Detected Value. Units in mg/L (water) or mg/kg (soil).

(3) Maximum Contaminant Level, EPA 1996. Units in mg/L.

(4) Maximum Contaminant Level, MSDEQ 1991. Units in mg/L.

(5) Pathways of exposure resulting in a chemical being identified as a COC.

(6) Total risk = (adult ingestion risk + adult dermal HQ, where appropriate) + (child ingestion HQ + child dermal HQ, where appropriate).

(7) Total Hazard Quotient = (adult ingestion HQ + adult dermal HQ, where appropriate) + (child ingestion HQ + child dermal HQ, where appropriate).

NR = Not Reported - No ARAR for this analyte.

NA = Not Applicable - The HQ did not exceed 0.1 or the risk did not wxceed $1x10^{-6}$

CURRENT ACTIVITIES AT SWMU 16/37 (WP-11)

The RFI and additional groundwater evaluation have been completed for SWMU 16/37. The proposed corrective action is explained in this document. Once the corrective action is approved, it will be implemented.

CORRECTIVE ACTION ALTERNATIVES SUMMARY

On the basis of protecting human health and the environment from hazardous constituent releases and preventing such releases in the future, long-term groundwater monitoring with land use controls was found to be the best-suited alternative for SWMU 16/37.

The RFI for SWMU 16/37 identified groundwater as the medium of concern for hypothetical future residential receptors (adult and child residents). Therefore, the selected remedial alternative for this site should consist of long-term groundwater monitoring and land use controls (land use restrictions and groundwater usage restrictions). Monitoring of groundwater would provide a reliable confirmation of detrimental changes in groundwater concentrations. Based on the ARAR comparison, monitoring wells at SWMU 16/37 would be sampled annually for the following COCs: 1,1-dichloroethene, tetrachloroethene, trichloroethene, antimony and arsenic. The concentrations of COCs will be evaluated annually to determine if a trend exists (i.e., are concentrations stable, increasing, or decreasing). The groundwater and land use restrictions would prevent future development of the site and also prevent the usage of site groundwater by potential human receptors. This corrective action alternative is the only alternative considered for SWMU 16/37. This corrective action will be evaluated at the end of every five-year period to determine its effectiveness. As part of this evaluation, a statistical analysis of the monitoring data will be performed.

CORRECTIVE ACTION ALTERNATIVE JUSTIFICATION

The selected remedy for SWMU 16/37 complies with each of the standards presented in EPA's RCRA Corrective Action Plan (U.S. EPA, 1994) as follows:

a) *Protect Human Health and the Environment.* The proposed remedy reduces groundwater exposure pathways to humans, and hence poses acceptable risks under the land use scenario. The LUCs ensure that the groundwater restrictions will be maintained. That is, the site will continue to be in a non-residential area of Keesler AFB. Groundwater in the surficial aquifer will be restricted from potable use. Well construction in the shallow aquifer will be prohibited on Keesler AFB.

b) *Attain Media Cleanup Standards Set by Implementing Agency.* The proposed remedy complies with the goal of reaching the MCL for the COCs. Natural attenuation will be evaluated as part of the annual monitoring at SWMU 16/37.

c) *Control the Source of Releases so as to Reduce or Eliminate, to the Extent Practicable, Further Releases that may Pose a Threat to Human Health and the Environment.* The cessation of past waste disposal practices eliminated, to the extent practicable, the cause of the groundwater contamination and have stopped a source of additional contamination to the environment at SWMU 16/37.

d) *Comply With Any Applicable Standards for Management of Wastes.* The activities at SWMU 16/37 now comply with the applicable standards for management of wastes. The selection of long-term monitoring of groundwater will not cause any violations regarding the standards for management of wastes.

e) *Other Factors.* The determination of the proposed remedy also took into account other factors noted in U.S. EPA (1994), including Technical Feasibility, Costs, Long Term Effectiveness and Permanence, Short Term Effectiveness, and Community Acceptance.

EXIT STRATEGY

Long term monitoring of the groundwater at SWMU 16/37 will be performed. Following each sampling event, the analytical data will be evaluated for contaminant concentration trends. If contaminant concentrations fall below cleanup goals for three consecutive years, then a recommendation of no further action will be proposed to the regulatory agencies. If natural attenuation of contaminants is determined to be occurring at this site, but contaminant concentrations remain above cleanup goals, a statistical analysis of the data will be performed to determine the approximate length of time for the levels to fall below cleanup goals. The monitoring frequency would be adjusted based on this length of time.

If natural attenuation of contaminants is determined not to be occurring, the data will be evaluated to assess if the contaminants are migrating toward downgradient wells. If the contaminants are determined to be stable after five consecutive sampling events, then a recommendation of no further action will be proposed to the regulatory agencies.

The exit strategy will be evaluated every five years to assess the appropriateness of the selected corrective action. If changes to the corrective action are necessary, recommendations will be made to EPA and MDEQ that could include modifications to the LTM program or the reevaluation of the corrective action and selection of a new technology.